



ARCHITECTURE STUDENT CONTEST

17th INTERNATIONAL EDITION, WARSAW 2022

#41. "Chain of Change"

Our proposal respects history, reflects it to this day and welcomes new technology for a more sustainable and energy efficient future.

The architecture of the new student housing complex honors the old factory building: The varying heights of the buildings decrease towards the factory leaving it noticeable and respected. The roof shapes of the towers take inspiration of the evolving section shapes of the factory building and symbolizing change.

To make a difference in making the world a better place, we have to make changes in the decisions how we build and what energy resources we choose to use. We promote renewable energy, wood construction and building a greener environment.

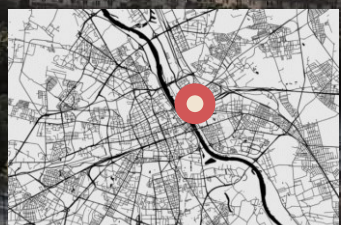


Location & background

The design area is located in Warsaw, Poland, by the banks of the Wisla river. Warsaw has a rich and long history, and it has been an important European city throughout its existence. It was the capital of the Polish-Lithuanian commonwealth until 1795, and it still holds a big role as an important center of trade, politics and culture.

The city has seen various wars, invasions, plagues and fires. Warsaw was completely rebuilt after the near-total destruction of the city due to the disasterous events during World War II. Warsaw manages to reborn from ashes like a Phoenix bird, and shows us an attitude of not giving up, looking forward and living in hope of better tomorrow.

The Old Town of Warsaw was listed on the UNESCO World Heritage Sites, as an example of a nearly complete reconstruction of the original settlement using original town plan.



Site analysis

The design area is located next to the bus and train stations, surrounded by good transportation links, schools, other services and green areas.

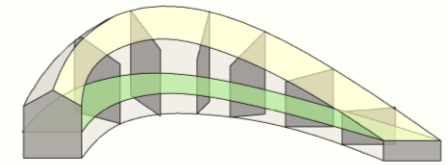
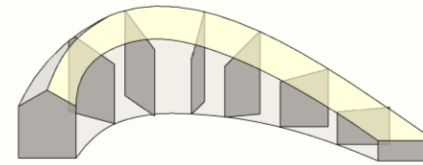
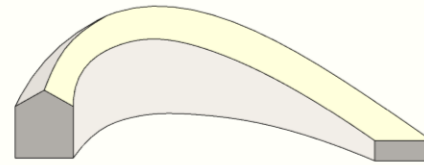
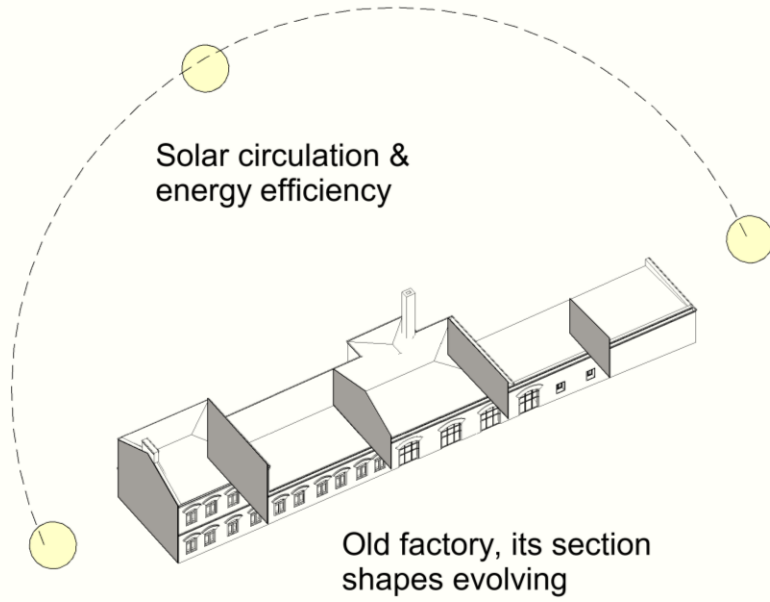
Warsaw is relatively sunny, averaging 12 hours daylight per day throughout the year. The longest days are in June, with 17 hours of daylight, and shortest days in December and January with 8 hours of daylight. Average monthly direct sunshine hours vary from 42 to 235 hours per month.

The area is considered as one of the driest major cities in Europe, averaging 163 rainy days a year, with approximately 530 mm yearly rainfall. The Wisla river works as a natural air corridor in the area.

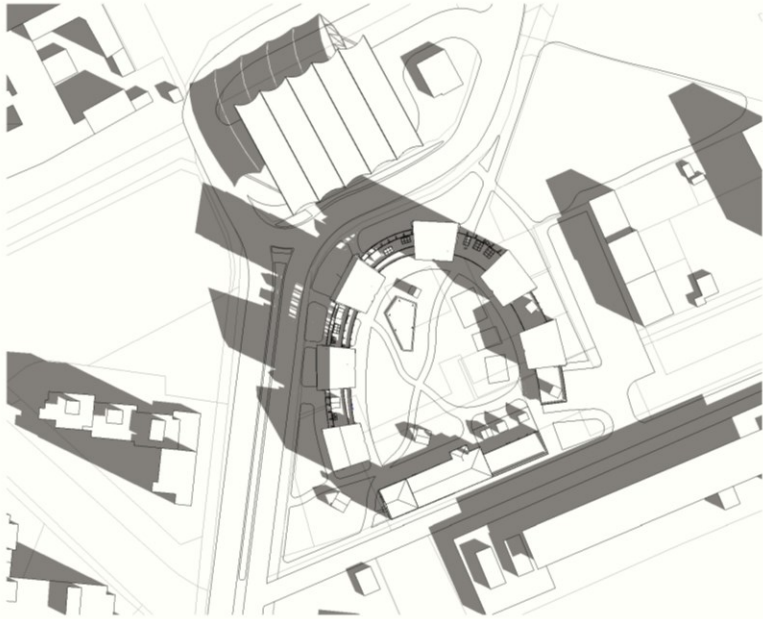
Surrounding building stock is considerably diverse and varying in height. There is an old factory building on the planning area, which will be preserved.



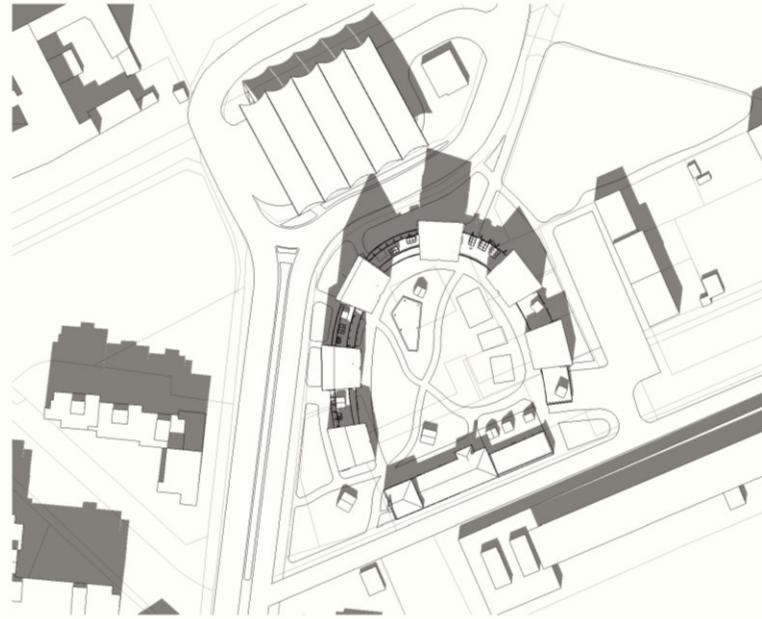
Concept



Solar study



Spring & fall 8 AM



Spring & fall 12 AM



Spring & fall 8 PM

Master plan



Area plan



Areas

<div></div> Art Gallery & Workshop	<div></div> Student housing	<div></div> Studying
<div></div> Restaurant & Cafe	<div></div> Shared spaces	<div></div> Garden
<div></div> Office & Conference	<div></div> Sports	
<div></div> Market	<div></div> Swimming Pool	

Public

Private

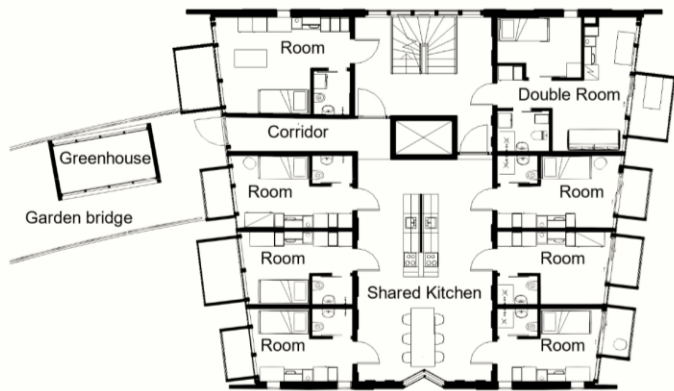


Floor plans

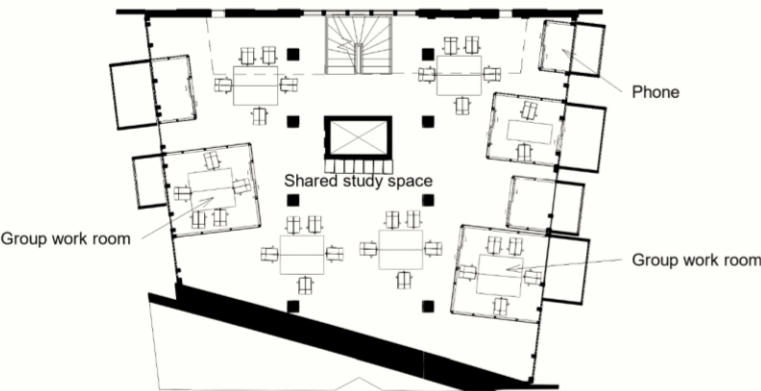
Ground floor example

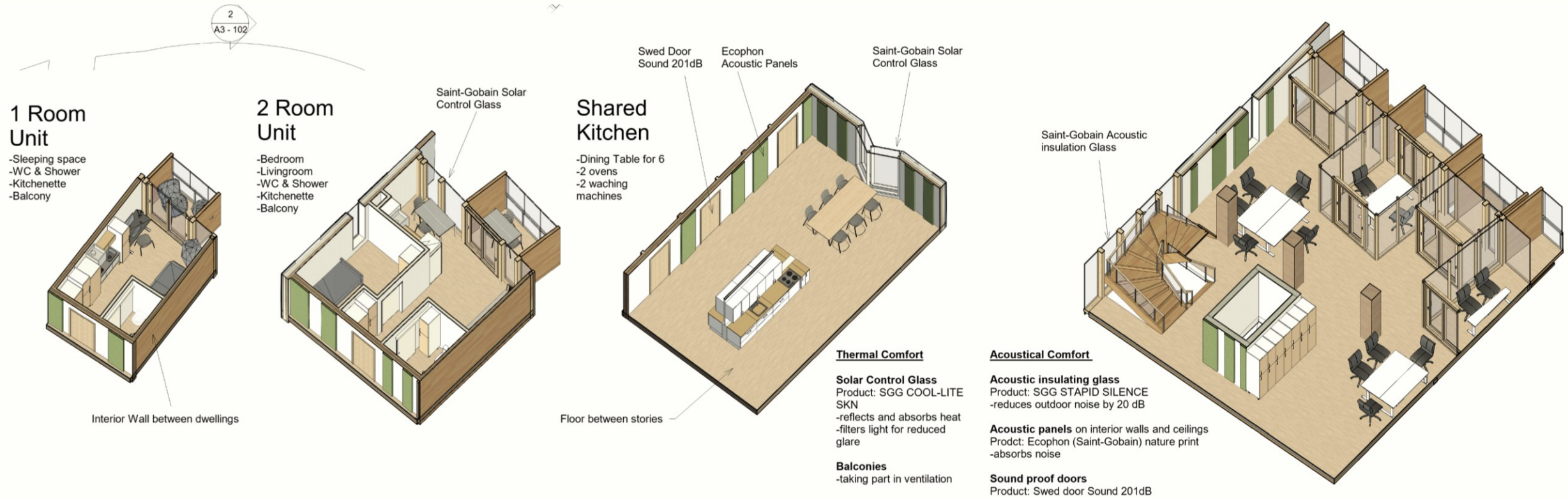


Example of 2-7 floors



Top floor example





Removable walls (conversion flexibility).

Floor plans

Chain of Change



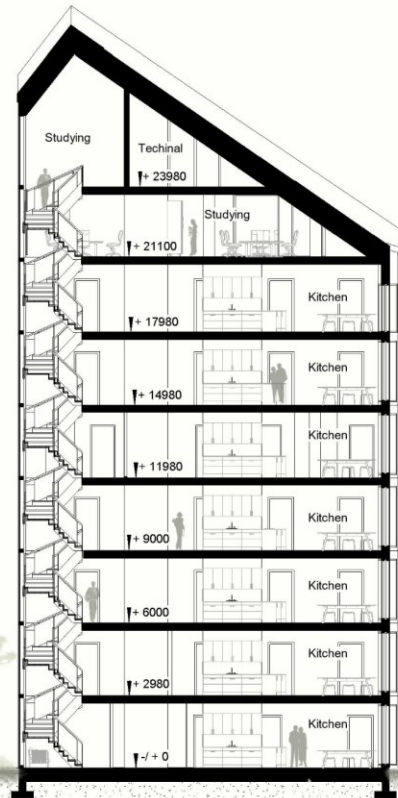


Construction & Sections



Construction & Sections

(units in millimeters)



Internal wall between dwellings:

Ceramic tile 10
Fixing mortar water resistant 5
Brushable waterproofing
Filler 5
Fiberboard 10+10
CLT 95
Mineral wool 50 **ISOVER premium 33**
CLT 95
Fiberboard 21
Interior cladding 18
(units in millimeters)

R'A = 53 dB
EI 60

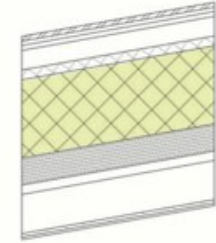


External wall:

Interior finish
Fiber gypsum board 18
CLT 140
Steam break
Mineral wool, **ISOVER Premium 33**, 223
Wind block insulation 9
Air space and fire break 48
Solar panel / fiber sement board

U value 0,18 W/m²K
R'A = 53 dB

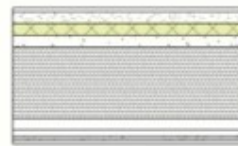
Windows
U value 0.8 W/m²K
R'A = 53 dB



External roof:

Solar panel
Steel roofing
Stads 22
Supporting stads 25
Underlay
Air space 100
Wind block insulation 50
Mineral wool, **ISOVER Premium 33**, 223
Steam block
CLT 138
Supporting stads 48
Fiber gypsum board 18
Inner finish

U value 0,18 W/m²K
EI 60



Floor between stories:

Parquet 15
Filler 50 + underfloor heating cable 100
Polypropylene fabric
Step sound insulation 50, **ISOVER ALU FLO**
Limestone grit 50
CLT 296
Blocking 48
Acoustic spring frame 25
Fiberboard 10+10
Interior cladding

R'A = 53 dB
EI 60



Base floor:

Floor covering
Cast concrete slab and underfloor heating cable 100
Thermal insulation 100, 1 meter edge area 200, **STYROFOAM**
leveling sand 20
drainage layer 400
the size of the gravel 6-16
mechanically compacted base moraine
tilt 1:50 to the drains

U value 0,18 W/m²K





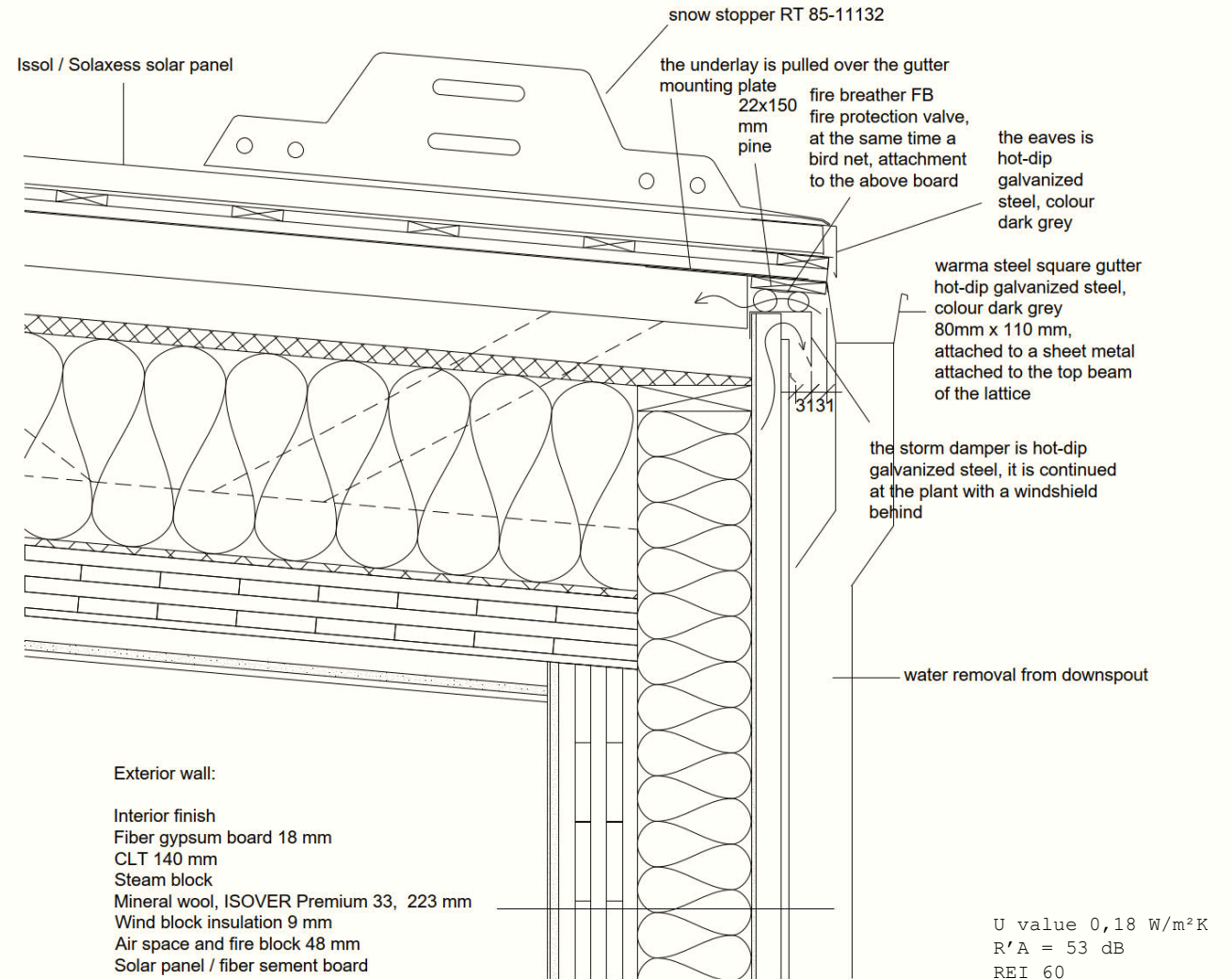
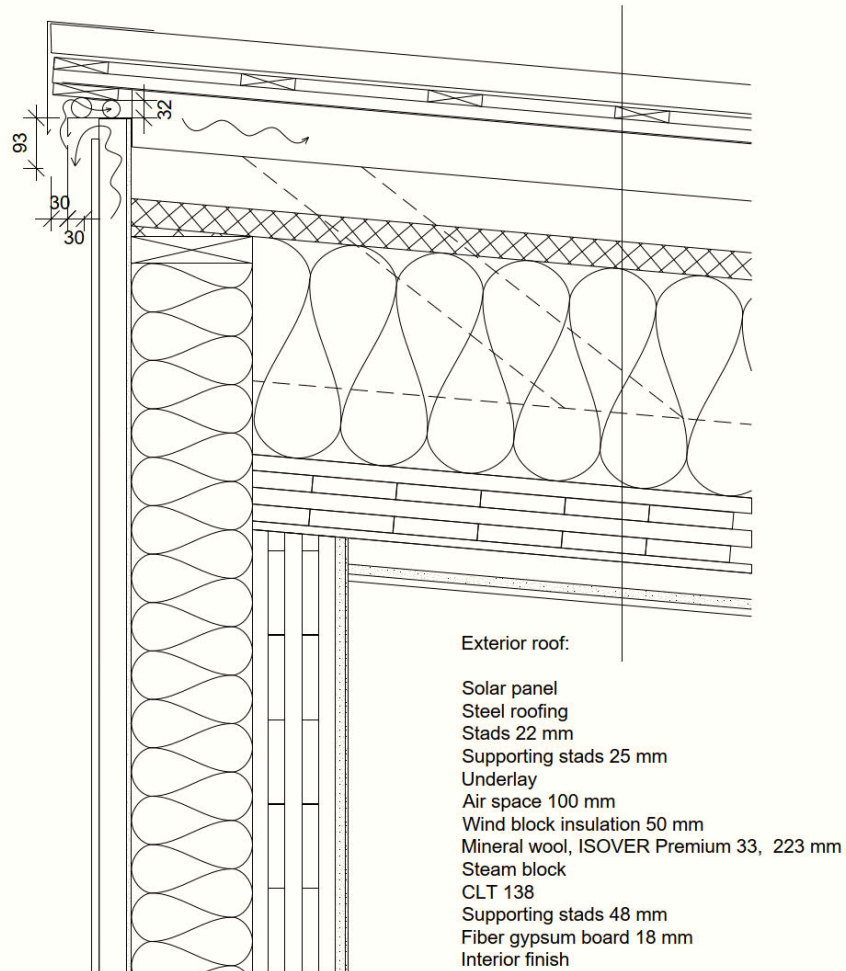
Elevations

1. St. Gobain solar control glass
2. White solar panel
3. White fiber cement board
4. Clear glass (St. Gobain acoustic insulation glass)
5. New light grey plastering
6. CLT columns and slabs





Details: Roof / external wall

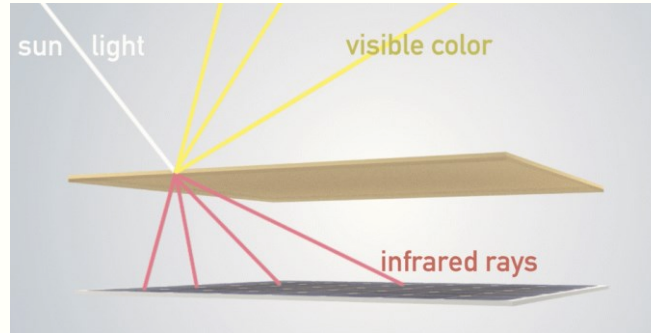


Details: Roof / external wall

WHITE PHOTOVOLTAICS -cladding system



The product is applied like traditional siding. It is mounted using the traditional installation techniques specific to facades. White photovoltaic glazings with an efficiency of 90 Watts/m² - white solar panels white modules. It acts as a second skin and plays the role of a thermal insulator.

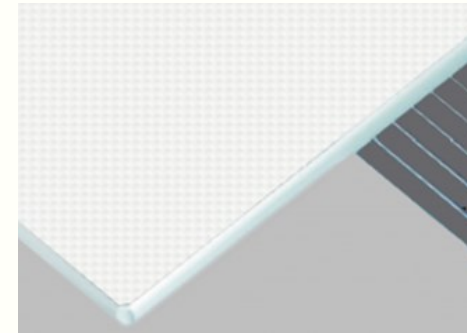


Thermal Comfort:

White Facade materials, white photovoltaics and white fibre cement boards. Reflects heat and sun light.

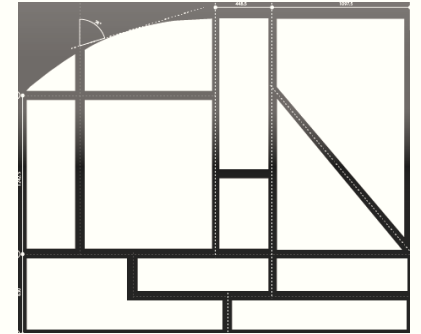
Fire safety:

Both facade materials are non-combustible.



The glass used in front is a textured glass for making the white matte and to avoid reflections. Albarino S - Saint-Gobain Glass

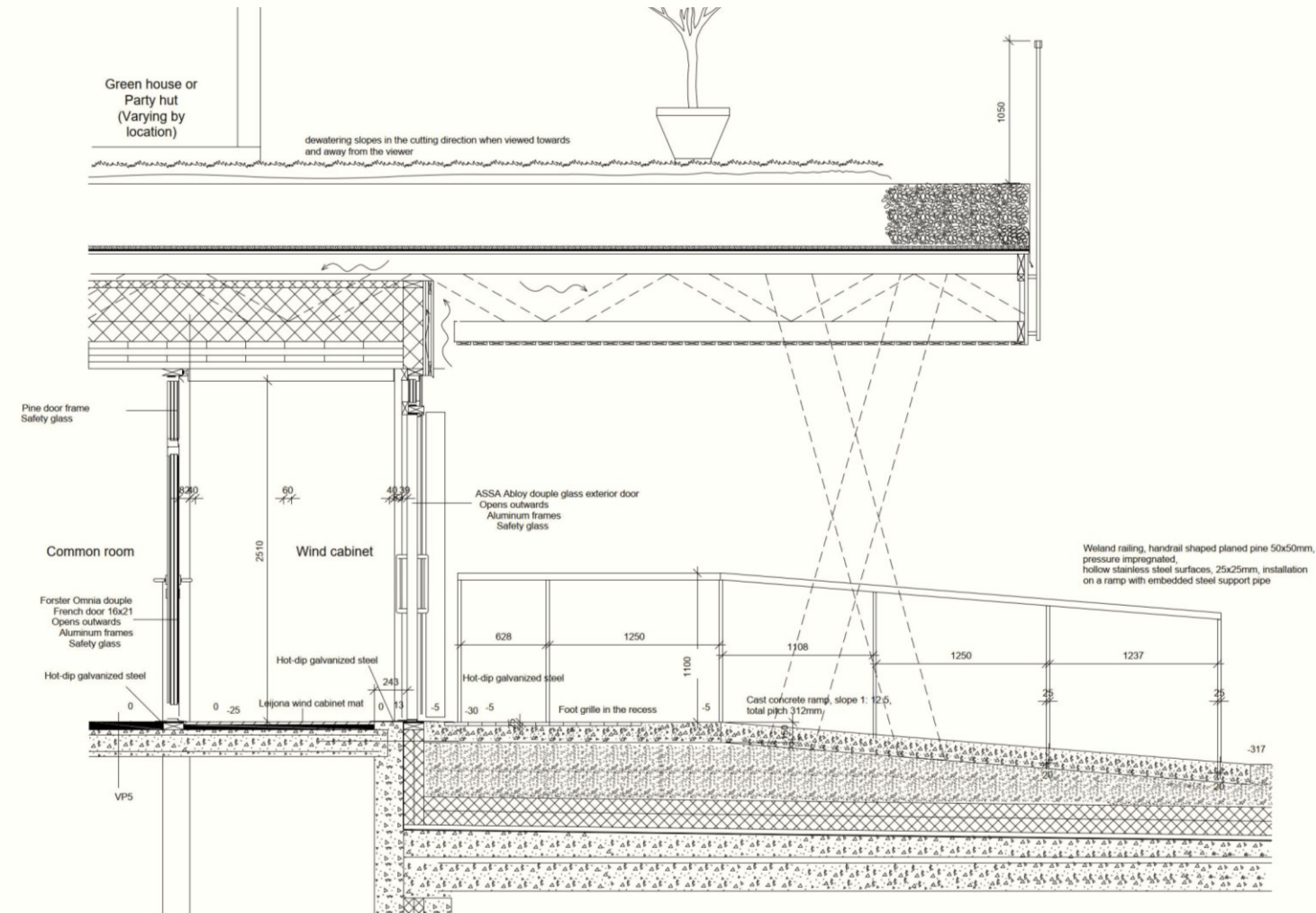
The product is a fully tempered laminated safety glass. It is a construction product that strictly follows photovoltaic and local construction norms. It is equipped with photovoltaic high-efficiency mono crystalline cells.



Various sizes and cuts



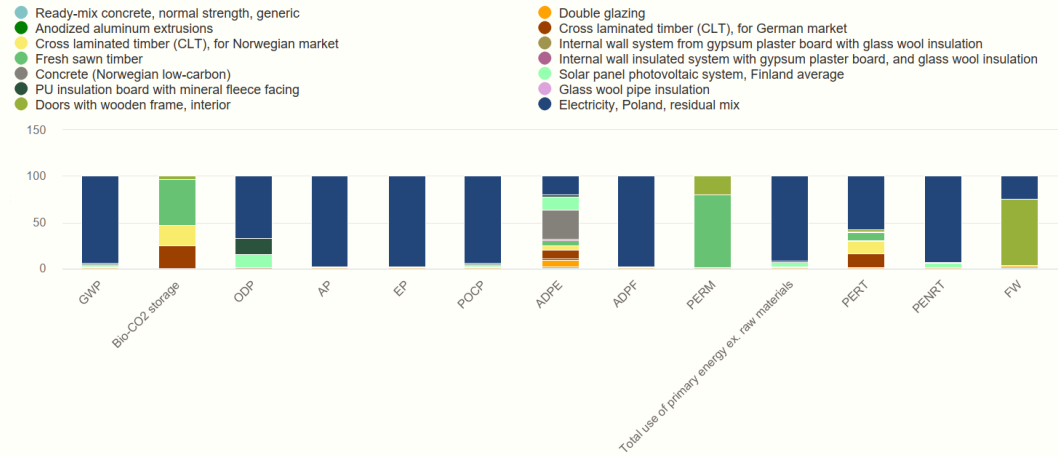
Details: Garden bridge / greenroof



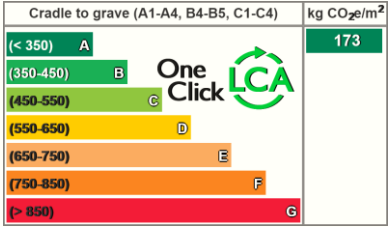
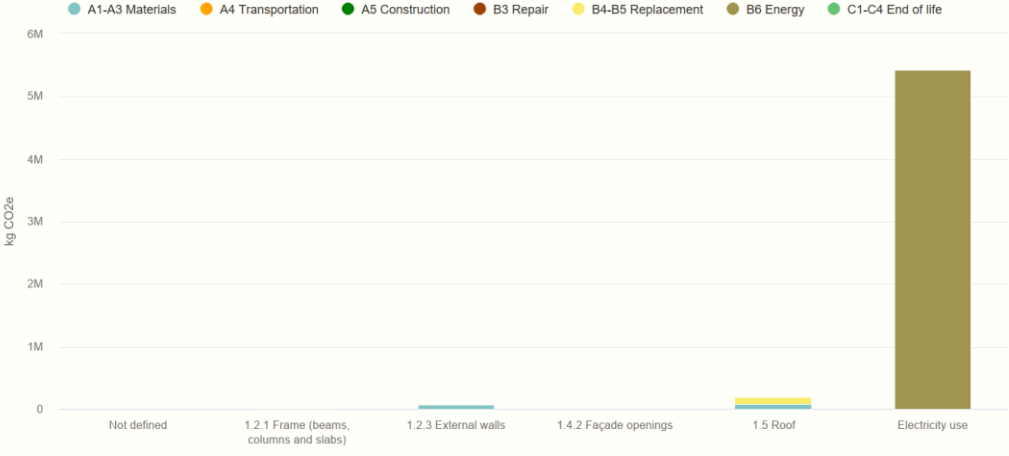


LCA Results

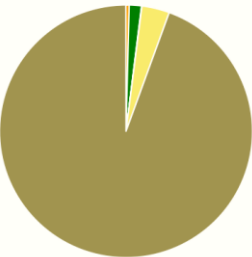
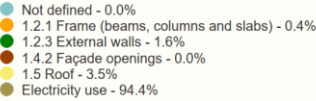
Life-cycle impacts by material as stacked columns



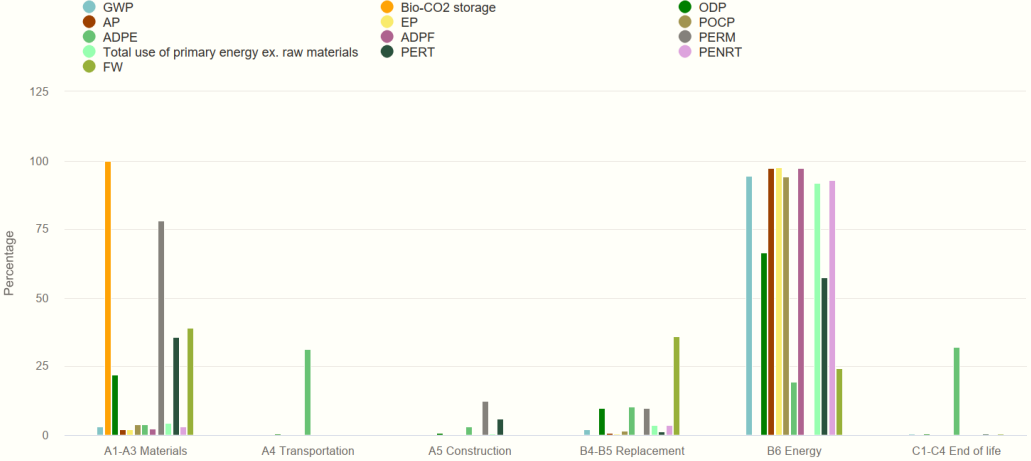
Global warming (GWP) grouped by Building Parts breakdown



Global warming kg CO2e - Classifications

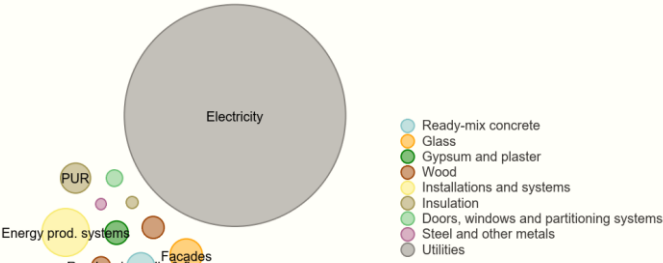


Results by life-cycle stage



Bubble chart, total life-cycle impact by resource type and subtype, Global warming

Hover your mouse over legends or the chart to highlight impacts. Bubble minimum and maximum sizes constrained for readability



Energy performance certificated

ENERGIATODISTUS 2018

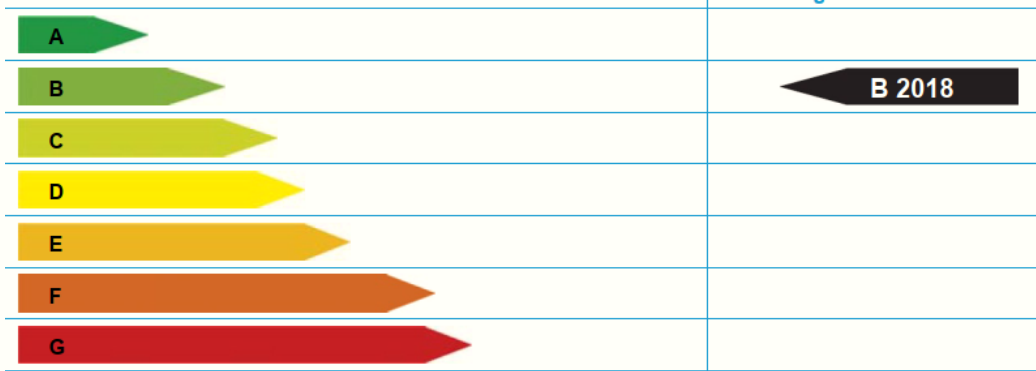
LUONNOSVERSIO - virallinen todistus ARA:n valvontajärjestelmästä

Rakennuksen nimi ja osoite: **House 3 Chain of Change**
Berka Joselewizca, Warsaw, Poland
03-803

Pysyvä rakennustunnus:
Rakennuksen valmistumisvuosi: **2022**
Rakennuksen käyttötarkoitusluokka:
Opiskelija-asuminen
Todistustunnus:

Energiatodistus on laadittu:
Uudelle rakennukselle rakennuslupaa haettaessa

Energiatoteutusluokka



E-LUVUN LASKENNAN LÄHTÖTIEDOT

Rakennuskohde				
Rakennuksen käyttötarkoitusluokka	Opiskelija-asuminen (Asuinkerrostalot)			
Rakennuksen valmistumisvuosi	2022	Lämmitetty nettoala	2130	m ²
Rakennusvaihe				
Ilmanvuotoluku q50	4	m ³ /(h m ²)		
	A	U	UxA	Osuus lämpöhäviöstä
	m ²	W/(m ² K)	W/K	%
Ulkoseinät	3100.00	0.17	527.00	43.44
Yläpohja	373.00	0.09	33.57	2.77
Alapohja	237.00	0.17	40.29	3.32
Ikkunat	586.00	1.00	586.00	48.30
Ulko-ovet	10.00	1.00	10.00	0.82
Kylmäsiilit	-	-	16.33	1.35
Ikkunat ilmansuunnittain				
	A	U	g kohtisuora-arvo	
	m ²	W/(m ² K)		
Pohjoinen	-	-	-	
Itä	-	-	-	
Etelä	-	-	-	
Länsi	-	-	-	
Koillinen	300.00	1.00	0.56	
Kaakko	18.00	1.00	0.56	
Lounas	250.00	1.00	0.56	
Luode	18.00	1.00	0.56	
Ilmanvaihtojärjestelmä				
Ilmanvaihtojärjestelmän kuvaus:	?			
	Ilmavirta tulo/poisto (m ³ /s) / (m ³ /s)	Järjestelmän SFP-luku kW/(m ³ /s)	LTO:n lämpötilasuhde	Jäätymisenesto
Pääilmanvaihtokoneet	1.065 / 1.065	1.5	> 80	C
Erillispöistot			-	
Ilmanvaihtojärjestelmä	1.065 / 1.065	1.5	-	3.00
Rakennuksen ilmanvaihtojärjestelmän LTO:n vuosihyötysuhde:		80 %		

(Calculated with finnish laskentapalvelut.fi calculator)

